Unit 16
Day 5
Evaluating Logarithms
Section 5.4

COMMON LOGARITHMS

The bases 10 and e are so important for logarithms that scientific and graphing calculators have keys for these bases.

For now on, we will abreviate $\log_{10} x$ as $\log\ x$.

natural log $\ln x$

CHANGE-OF-BASE THEOREM

For any positive real numbers x , a , and b , where $a \neq 1$ and $b \neq 1$:

$$\log_a x = \frac{\log_b x}{\log_b a}$$

Use the change-of-base theorem to find an approximation for each of the following logarithms. Give the answer to four decimal places.

1) $\log_6 3 = \frac{\log 3}{\log 6}$

$= \frac{.477}{.7781}$

$= .6131$

2) $\log_2 5 = \frac{\log 5}{\log 2}$

2.3219

3) $\log_7 28$

$$\frac{\log 28}{\log 7} = 1.7124$$

4) $\log_5 180$

$$\frac{\log 180}{\log 5} = 3.2266$$

4) $\log_3 142$

$\frac{\log 142}{\log 3} =$

~~4.7124~~

4.5110

5) $\log_{16} 27$

~~3.2266~~

1.1887

HOMEWORK

Day 5 p. 392: 35-42
Review p 416: 9-32, 39-42, 54-58